

**CLAIMS**

1.- A device for producing bypasses under pressure in fluid piping systems, of the type constituted of a horizontal T-shaped body with a central radial conduit (1) which can be coupled at its lower mouth (6) to a seat or collar for joining with the pipe (27) to be bypassed, and a side conduit with a mouth (7) for extracting the fluid from the bypass, the radial conduit (1) having a detachable access cover (2) at its upper portion, characterized in that it comprises a perforation cutter (3), in the form of an inverted cup having, at its portion opposite to the toothed crown (11), a coaxial cylindrical extension with a stepping in two consecutive threaded areas (32 and 33) of a decreasing diameter, one threaded area (33) being suitable for the coupling of the cutter with a threaded area (10) existing in the upper portion of the radial conduit; and in that said extension of the cutter (3) has a hole (51) at its upper base connected to a feed tool, co-aided by the threaded area (32); and in that it comprises a tool for the handling and feed of the cutter (3), constituted of a body (17) which can be coupled to the upper portion of the radial conduit (1) with a shaft (22) which can be detached through a screw (21) operatively suitable for the extraction of the cutter (33) from the threaded area of its seat in the upper portion and for the perforation of the pipe (27) to be bypassed.

2.- A device for producing bypasses under pressure in fluid piping systems according to claim 1, characterized in that the boring teeth (11) existing in the lower crown of the cutter (3) form a boring diameter of greater dimensions than the cylindrical outline (13) of the cutter (3).

3.- A device for producing bypasses under pressure in fluid piping systems according to claim 1, characterized in that it comprises at the upper portion of the radial conduit (1) a neck (8) or coupling with an inner threaded area (10) for coupling of the cutter (3) and an outer threaded area (9)

for coupling of a cover (2) or a perforation tool.

5 4.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 3, characterized in that the outer threaded area (9) of the neck (8) has a gasket (5) with a cover (2) or with the perforation tool at its base.

10 5.- A device for producing bypasses under pressure in fluid piping systems according to claims 1, 3 and 4, characterized in that the perforation tool comprises a tubular body (17) which can be coupled to the outer thread (9) of the neck (8) by means of a mouth (53) and which has a longitudinally movable shaft (22) connected to a threaded screw (21), one end of this shaft (22) being connected in a detachable manner to the upper portion of the cutter (3) and  
15 the other end suitable for the coupling of a tool or rotating wrench.

20 6.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 5, characterized in that the shaft (22) comprises a male connector (15) with a nut (16) for coupling to the upper end of the cutter (3); and in that said male connector (15) comprises a shape according to the hole (51) or cavity existing in the upper portion of the cutter (3); and in that the nut (16) is suitable for its coupling with the threaded  
25 area (32) for fixing thereof; and in that the shaft (22) comprises a retention washer (23) for retaining said nut (16) preventing an incorrect assembly of the shaft with the cutter.

30 7.- A device for producing bypasses under pressure in fluid piping systems according to claims 1, 3 and 5, characterized in that the body (17) of the tool has an inner chamber (26) after the mouth (53) connecting with the conduit (1) through the hole of the neck (8); and in that it has a valve (18) connecting said inner chamber (26) with the outside.

35 8.- A device for producing bypasses under pressure in fluid piping systems according to claims 1, 5 and 6,

characterized in that it comprises a threaded screw (21) at the upper portion of the body (17), with a hollow core, wherein the longitudinally sliding shaft (22) is located; and in that said screw (21) comprises a thread (14) of a length L greater than the advancing shifting needed by the cutter (3) when it perforates the pipe (27); and in that it comprises a pin (24) housed in the upper portion of the screw (21) and can be positioned in a series of transverse holes (28) of the shaft (22) for joining them by interlinking; and in that the pin (24) has a retention ring (25) at one end.

9.- A device for producing bypasses under pressure in fluid piping systems according to claims 1, 5, 6 and 7, characterized in that the body (17) has a bearing (20) and a gasket (19) around the shaft (22), both arranged between the inner chamber (26) and the upper screw (21).

10.- A device for producing bypasses under pressure in fluid piping systems according to claims 1, 5, 6 and 8, characterized in that the screw (21) comprises a circular groove (14-a) close to the lower end of the thread (14) to warn of the end of the thread.

11.- A device for producing bypasses under pressure in fluid piping systems according to claims 1, 2, 5 and 8, characterized in that the teeth (11) of the cutter (3) have screw threads (12) on their inner outline which are suitable for firmly holding the perforated disc (52) and shavings (29); and in that said screw threads (12) are of the same pitch as the threaded area (14) of the screw (21).

12.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 2, characterized in that in an embodiment alternative, the cutter (3) has a flared tapering (30) of an increasing nature and a larger diameter than the outer outline (13) of the cutter and the diameter of said toothed crown (11) operatively suitable for plugging the opening made in pipe (27) and carrying out the function of interrupting the fluid.

13.- A device for producing bypasses under pressure in fluid piping systems according to claim 1, characterized in that threaded area (32) has a notably different pitch than threaded area (33).

5 14.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 3, characterized in that the threaded area (33) of the cutter has a groove next to its base in which there exists a gasket (4) compressible with the neck (8) when said cutter (3) is in idle  
10 position coupled to it.

15 15.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 3, characterized in that it comprises an anti-release nut (31) which can be coupled to the threaded area (32) of the cutter and supported on the mouth of the neck (8) of the conduit (1), which can be covered with the cover (2).

20 16.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 3, characterized in that in an alternative embodiment, it comprises a cover (55) fitted on the neck (8), there being around it a cylindrical sleeve (54) encircling it, said sleeve being extended on the radial conduit (1), suitable for their joining by heat fusion, gluing, welding or any other permanent or semi-permanent means.

25 17.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 5, characterized in that it comprises a protective arch (56) on the body (17) of the tool, projecting from the shaft (22) outside of said body (17); and in that the arch (56) has a U  
30 shape and its length is equal to or greater than the length of the shaft (22) in maximum extension of the body (17); and in that the arch (56) is arranged on either side of the trajectory of said shaft (22).

35 18.- A device for producing bypasses under pressure in fluid piping systems according to claims 1, 2 and 11,

characterized in that it comprises a series of windows (57) or through holes in the body of the cutter (1) or cutting tool, operatively suitable for connecting said pipe and the space behind the radial conduit (1) and the bypass in general during the perforation of the inside of the pipe (27); and in that said windows (57) are preferably arranged in the surrounding outline (13) of the cutter (3).

19.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 5, characterized in that there is a cylindrical or tapered male connector (61) on said extension (33) of the cutter (3) at its upper portion connected to a mouth (64) of the shaft (22) of the perforation tool connected by means of a pin (62), clip or the like.

20.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 5, characterized in that the body (17) of the perforation tool has two valves (18 and 62) for coupling the pressurization mechanism and testing the bypass and a gas gauge for verification in an independent manner.

21.- A device for producing bypasses under pressure in fluid piping systems according to claim 19, characterized in that the pin (62) connected to the male connector (61) and the mouth (64) of the shaft (22) comprises a thread or locking means.

22.- A device for producing bypasses under pressure in fluid piping systems according to claim 5, characterized in that the shaft (22) comprises in its shank a groove (67) or connection close to the mouth (64), between the chamber (26) and the outside, bridging the gasket (19) and the bearing (20) through the cavity of the screw (21) when said shaft (22) is coupled to the cutter (3) arranged on the neck (8) operatively suitable for preventing a false measurement of the bypass leak-tightness due to the plugging effect of said cutter (3) warning the operator of the outlet of pressurization fluid

through said groove (67) and the cavity of the screw (21).

5           23.- A device for producing bypasses under pressure in fluid piping systems according to claims 1, 2 or 5, characterized in that the cutter (3) comprises overdimensioned threaded projections (60) at its inner outline and behind the teeth (11), with the screw threads (12) being interrupted by spaces without screw threads.

10           24.- A device for producing bypasses under pressure in fluid piping systems according to claim 1, characterized in that the teeth (11) existing in the outline of the cutter (3) are separated by small spaces (59).

15           25.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 3, characterized in that the thread (9) of the neck (8) has a longitudinal groove (58) operatively suitable for preventing pressurization of the chamber formed between the cover (2) and the neck (8) due to a residual leak.

20           26.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 19, characterized in that it comprises a locking and anti-release pin (65) with an elastic retention ring, clip or the like, housed in the transverse hole of the male connector (61) of the cutter (3), under the cover (2).

25           27.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 and 19, characterized in that in an embodiment alternative, it comprises a retention clip, catch or the like housed in the transverse hole of the male connector (61) of the cutter (3), under the cover (2).

30           28.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 to 27, characterized in that in an embodiment alternative, the body of the T-shaped bypass is constituted of a conventional T-shape (34) with male ends having a neck (36) connected with  
35           the cutter (3) and the cover (2) at the open end (35) of the

radial conduit by means of welding, gluing or the like.

5 29.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 to 27, characterized in that in an embodiment alternative, the body of the T-shaped bypass is constituted of a T-shape with female ends (37) and a male bypass conduit (38), to which the neck (39) and the seat (40) or base which can be coupled to the pipe are joined by welding or gluing.

10 30.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 to 27, characterized in that in an embodiment alternative, the body of the T-shaped bypass is constituted of a T-shape (41) manufactured in one piece for the application, which from the beginning, incorporates the neck (42).

15 31.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 to 27, characterized in that in an embodiment alternative, the body of the T-shaped bypass is constituted of a T-shape (43) manufactured in one piece for the application, which incorporates the neck (44) and the base (45), from the beginning, to couple to the pipe (27) to be bypassed.

20 32.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 to 27, characterized in that in an embodiment alternative, the lower male mouth (47) of the T-shape is welded or glued to a collar with a female mouth (48).

25 33.- A device for producing bypasses under pressure in fluid piping systems according to claims 1 to 27, characterized in that in an embodiment alternative, the lower male mouth (47) of the T-shape is connected to the collar (48) by means of welding or gluing or by means of an intermediate sleeve (50).

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